

IN THE CLAIMS

Please cancel Claims 18 and 37 without prejudice or disclaimer of the subject matter presented therein.

Please amend Claims 14, 19-21, 34, 35, 38, 39, 44, and 45 as follows. In accordance with the revised amendment format, all claims are presented below.

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1. (Original) An electron-emitting apparatus comprising:

A) a first electrode and a second electrode disposed on a surface of a substrate;

B) first voltage application means for applying to said second electrode a potential higher than a potential applied to said first electrode;

C) an electron-emitting member disposed on said first electrode;

D) a third electrode disposed so as to face said substrate, electrons emitted from said electron-emitting member reaching said third electrode; and

E) second voltage application means for applying to said third electrode a potential higher than each of the potentials applied to said first and second electrodes,

wherein a surface of said electron-emitting member is placed between a plane containing a surface of said second electrode and substantially parallel to the surface of said substrate and a plane containing a surface of said third electrode and substantially parallel to the surface of said substrate, and

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wherein when the distance between said second electrode and said first electrode is  $d$ ; the potential difference applied between said second electrode and said first electrode by said first voltage application means is  $V_1$ ; the distance between said third electrode and said substrate is  $H$ ; and the potential difference between the potential applied to said third electrode by said second voltage application means and the potential applied to said first electrode by said first voltage application means is  $V_2$ , then an electric field  $E_1 = V_1/d$  is within the range from 1 to 50 times an electric field  $E_2 = V_2/H$ .

2. (Original) An apparatus according to claim 1, wherein the thickness of said first electrode is larger than the thickness of said second electrode.

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3. (Original) An apparatus according to claim 1, wherein said electron-emitting member extends from a position on said first electrode to a position on said substrate between said first electrode and said second electrode.

4. (Original) An apparatus according to claim 1, wherein said substrate has a difference in level between said second electrode and said first electrode, and said third electrode is closer to said first electrode than to said second electrode.

5. (Original) An apparatus according to claim 1, wherein said electron-emitting member is made of a material containing carbon as a main ingredient.

6. (Original) An apparatus according to claim 5, wherein said material containing carbon as a main ingredient comprises fibrous carbon.

7. (Original) An apparatus according to claim 6, wherein said fibrous carbon comprises a graphite nanofiber, a carbon nanotube, amorphous carbon, or a mixture of at least two of these materials.

8. (Original) An apparatus according to claim 7, wherein said fibrous carbon is grown by means of catalytic particles.

9. (Original) An apparatus according to claim 8, wherein catalytic particles are made of Pd, Ni, Fe, Co or an alloy of at least two of these metals.

10. (Original) An apparatus according to any one of claims 1 to 9, wherein a plurality of said first electrodes and a plurality of said second electrodes are disposed on the surface of said substrate.

11. (Original) An apparatus according to claim 10, wherein said plurality of first electrodes and said plurality of second electrodes are electrically connected to wiring in matrix form.

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12. (Original) An apparatus according to claim 10, wherein a phosphor capable of emitting light when irradiated with electrons emitted from said electron-emitting member is provided on said third electrode.

13. (Original) An image display apparatus using an electron-emitting apparatus according to claim 12.

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14. (Currently Amended) An electron-emitting device comprising:

A) a cathode electrode and a gate electrode arranged at an interval on a surface of a first substrate; and

B) ~~a fiber containing~~ a plurality of carbon fibers each of which contains carbon as a main ingredient, arranged on said cathode electrode and connected electrically to said cathode electrode,

wherein each of said carbon fibers ~~containing carbon as a main ingredient~~ has a plurality of graphenes which are layered so as not to be parallel to an axis direction of said fiber.

15. (Original) An electron-emitting device according to claim 14, wherein the plurality of graphenes are substantially parallel to each other.

16-18 (Cancelled)

19. (Currently Amended) A light-emitting apparatus comprising an electron-emitting device according to any one of claims ~~14, 15, or 18~~ 14 or 15, and a light-emitting member.

20. (Currently Amended) An image display apparatus comprising a plurality of electron-emitting devices and a light emitting member capable of emitting light when irradiated with electrons emitting from some of said plurality of electron-emitting devices, wherein each of said plurality of electron-emitting devices is constituted by the electron-emitting device according to any one of claims ~~14, 15, or 18~~ 14 or 15.

21. (Currently Amended) An electron-emitting apparatus comprising:

- A) a first electrode and a second electrode disposed on a surface of a substrate;
- B) first voltage application means for applying to said second electrode a potential higher than a potential applied to said first electrode;
- C) a plurality of fibers disposed on said first electrode, said fibers containing carbon as a main constituent;
- D) a third electrode disposed so as to face said substrate, electrons emitted from said fibers reaching said third electrode; and
- E) second voltage application means for applying to said third electrode a potential higher than each of the potentials applied to said first and second electrodes,

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wherein a surface region of said fibers is placed between a plane containing, which contains a surface of said second electrode and is substantially parallel to the surface of said substrate, and a plane containing, which contains a surface of said third electrode and is substantially parallel to the surface of said substrate.

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22. (Original) An electron-emitting apparatus according to claim 21, wherein when the distance between said second electrode and said first electrode is  $d$ ; the potential difference applied between said second electrode and said first electrode by said first voltage application means is  $V1$ ; the distance between said third electrode and said substrate is  $H$ ; and the potential difference between the potential applied to said third electrode by said second voltage application means and the potential applied to said first electrode is  $V2$ , then an electric field  $E1 = V1/d$  is within the range from 1 to 50 times an electric field  $E2 = V2/H$ .

23. (Original) An apparatus according to claim 21, wherein each of said fibers having carbon as a main ingredient comprises a carbon nanotube.

24. (Original) An apparatus according to claim 21, wherein each of said fibers containing carbon as a main ingredient comprises a plurality of graphenes stacked so as to be nonparallel to the axis direction of said fiber.

25. (Original) An apparatus according to claim 21, wherein a material more effective in accelerating deposition of carbon than the material of said first electrode is provided between said fibers having carbon as a main ingredient and said cathode.

26. (Original) An apparatus according to claim 25, wherein said material effective in accelerating deposition of carbon comprises Pd, Ni, Fe, Co or an alloy formed of at least two of said metals.

27. (Original) An apparatus according to claim 25, wherein said material effective in accelerating deposition of carbon is provided in the form of a plurality of particles on said first electrode.

28. (Original) An apparatus according to claim 27, wherein said plurality of particles are provided on said first electrode at a density of  $10^{10}$  particles/cm<sup>2</sup> or higher.

29. (Original) An apparatus according to claim 21, wherein the thickness of said first electrode is larger than the thickness of said second electrode.

30. (Original) An apparatus according to any one of claims 21 to 29, wherein a plurality of said first electrodes and a plurality of said second electrodes are disposed on the surface of said substrate

31. (Original) An apparatus according to claim 30, wherein said plurality of first electrodes and said plurality of second electrodes are electrically connected to wiring in matrix form.

32. (Original) An apparatus according to claim 30, wherein a phosphor capable of emitting light when irradiated with electrons emitted from said fibers is provided on said third electrode.

33. (Original) An image display apparatus using an electron-emitting apparatus according to claim 32.

34. (Currently Amended) An electron-emitting device comprising:  
A) a first electrode and a second electrode disposed on a surface of a substrate, a gap being formed between said first and second electrodes; and

B) a fiber provided on said first electrode, said fiber containing a plurality of carbon fibers, each of which contains carbon as a main ingredient, arranged on said first electrode and connected electrically to said first electrode.



wherein said second electrode ~~comprises~~ is an electrode for controlling electron emission of electrodes from said carbon fibers, ~~containing carbon as a main ingredient,~~ and

*et* wherein each of said carbon fibers ~~containing carbon as a main ingredient~~ comprises graphene.

*D)* 35. (Currently Amended) An electron-emitting device according to claim 34, wherein the distance between an extreme end of said ~~fiber~~ carbon fibers and the surface of said substrate is larger than the distance between the surface of said second electrode and the surface of said substrate.

36. (Original) An electron-emitting device according to claim 34, wherein said graphene comprises cylindrical graphene.

37. (Cancelled)

38. (Currently Amended) A light-emitting apparatus comprising an electron-emitting device according to any one of claims 34 to 37 36, and a light-emitting member.

39. (Currently Amended) An image display apparatus comprising a plurality of electron-emitting devices and a light emitting member capable of emitting light when irradiated with electrons emitted from some of said plurality of electron-emitting devices, wherein each of said plurality of electron-emitting devices is constituted by an electron-emitting device according to any one of claims 34 to ~~37~~ 36.

40. (Previously Added) A light-emitting apparatus according to claim 19, wherein said light-emitting member comprises a phosphor and an anode electrode, and is arranged on a second substrate arranged separately from said first substrate.

41. (Previously Added) An image display apparatus according to claim 20, wherein said light-emitting member comprises a phosphor and an anode electrode, and is arranged on a second substrate arranged separately from said first substrate.

42. (Previously Added) A light-emitting apparatus according to claim 38, wherein said light-emitting member comprises a phosphor and an anode electrode, and is arranged on an additional substrate arranged separately from said substrate.

43. (Previously Added) An image display apparatus according to claim 39, wherein said light-emitting member comprises a phosphor and an anode electrode, and is arranged on an additional substrate arranged separately from said substrate.

44. (Currently Amended) An image display apparatus, comprising:

A) an electron-emitting device arranged on a first substrate, and comprising a cathode electrode and a gate electrode; and

B) a phosphor and an anode electrode arranged on a second substrate,

wherein said electron-emitting device comprises a plurality of carbon fibers ~~containing each of which contains~~ carbon as a main ingredient, electrically connected to said cathode electrode, and wherein each of said carbon fibers ~~containing carbon as a main ingredient~~ has a plurality of graphenes which are layered so as not to be parallel to an axis direction of said each fiber.

45. (Currently Amended) A triode type electron-emitting apparatus, comprising:

A) an electron-emitting device arranged on a first substrate, and comprising a cathode electrode and a gate electrode; and

B) an anode electrode arranged on a second substrate,

wherein said electron-emitting device comprises a plurality of carbon fibers each of which ~~containing contains~~ carbon as a main ingredient, electrically connected to said cathode electrode, and wherein each of said carbon fibers ~~containing carbon as a main ingredient~~ has a plurality of graphenes layered so as not to be parallel to an axis direction of said each fiber.